Worksheet 1

Fill in the missing word by choosing one from the word list.

WORD LIST			
atom	atomic number	Bohr	Chadwick
Conservation of Matter	Dalton	Definite Proportions	electron
energy level	isotopes	Lavoisier	mass number
Multiple Proportions	neutron	nucleus	Planck
proton	Proust	quantum	Rutherford
subatomic particle	Thomson		

More than 2 000 years ago Greek philosophers proposed the existence of very small indivisible particles, called …(1)…. The theory that such particles existed was supported much later by …(2)…. He proposed in his Law of …(3)… that matter cannot be created or destroyed. Then …(4)… proposed in his Law of …(5)…, that the ratio of the masses of elements in any given compound is always the same. The Law of …(6)… – proposed soon after – states that the mass of one element that combines with a fixed mass of another element in different compounds are in simple whole-number ratios. An atomic theory based on these laws was developed by …(7)….

It was later proposed that the atom was not indivisible, but is made up of smaller particles, each of which is called a(n) …(8)…. These particles include the:

- negatively charged …(9)…, discovered by …(10)…
- positively charged …(11)… and
- uncharged …(12)…, discovered by …(13)….

The latter two particles are present in the …(14)… of the atom, which was discovered by …(15)… in his gold foil experiment.

The number of positively charged particles in an atom is called its …(16)…. The sum of the positively charged particles and the uncharged particles is called the …(17)… of the atom. Atoms that have the same number of positively charged particles, but different numbers of uncharged particles are called …(18)….

The Danish physicist …(19)… proposed a model of the atom in which the electrons orbit the nucleus without losing energy. He called each possible orbit a(n) …(20)….

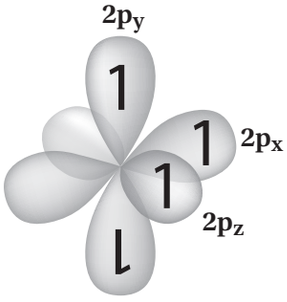
Practice questions

1 Compared to the charge and mass of a proton, an electron has ...
- **A** the same charge and a smaller mass.
- **B** the same charge and the same mass.
- **C** an opposite charge and a smaller mass.
- **D** an opposite charge and the same mass.

2 An ion with 5 protons, 6 neutrons and a charge of 3+ has an atomic number of:
- **A** 5
- **B** 6
- **C** 8
- **D** 11

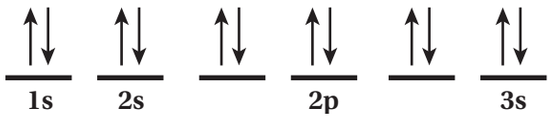
3 What is the mass number of an atom which contains 28 protons, 28 electrons and 34 neutrons?
- **A** 28
- **B** 56
- **C** 62
- **D** 90

4 Study the orbital diagram below. It represents the element ...



- **A** sulfur.
- **B** oxygen.
- **C** carbon.
- **D** silicon.

5 Study the representation of the electrons found in a particular element.



Which of the statements is INCORRECT?
- **A** The element represented is magnesium.
- **B** The element is found in the third period of the periodic table.
- **C** The element is a noble gas as its energy level is full.
- **D** The element will form a cation when ionised.

6 Which ONE of the following options shows particles that have the SAME number of electrons?
- **A** Be; Mg; Ca
- **B** F^-; Cl^-; Br^-
- **C** Na^+; Mg^{2+}; Ar
- **D** S^{2-}; Ar; Ca^{2+}